

Engineering Technology

Devoted to the implementation of existing technology within a recognized field of engineering. They work with engineers to improve products, manufacturing or construction practices. They are employed in a wide variety of fields.

In general, the work of engineering technologists focuses on the applied and practical application of engineering principles, whereas the work of engineers emphasizes the theoretical aspects of mathematical, scientific and engineering principles. The National Society of Professional Engineers describes the difference between engineering and engineering technology:

The [Accreditation Board for Engineering and Technology](#) describes the difference between engineering and engineering technology as: "Engineering and technology are separate, but related professions. Here are some of the ways they differ:

- Engineering undergraduate programs include more mathematics work and higher level mathematics than technology programs.
- Engineering undergraduate programs often focus on theory, while technology programs usually focus on application.
- Once they enter the workforce, engineering graduates typically spend their time planning, while engineering technology graduates spend their time making plans work.
- At ABET, engineering and engineering technology programs are evaluated and accredited by two separate accreditation commissions using two separate sets of accreditation criteria.
- Graduates from engineering programs are called engineers, while graduates of technology programs are often called technologists.
- Some U.S. state boards of professional engineering licensure will allow only graduates of engineering programs—not engineering technology programs—to become licensed engineers."

Engineers generally operate in conceptual design and product development, while technologists generally work in testing, construction, or field work.

1. An engineering program should be designed to prepare students for professional practice, for advanced study in a specific engineering discipline, and for a life-time of independent learning.
2. Liberal Arts Education needs to include technological literacy -- including science, math, and engineering. Technology shapes our society more strongly than anything else does, and its rapid change demands a citizenry conversant in the social and technical processes that create this change. Informed decisions in business, law, and education -- indeed in every facet of life -- require a basic understanding of technology.
3. "Engineering" is the profession in which knowledge of advanced mathematical and natural sciences gained by higher education, experience, and practice is devoted to the creation of new technology for the benefit of humanity. Engineering education for the professional focuses primarily on the conceptual and theoretical aspects of science and engineering aimed at preparing graduates for the practice of engineering closest to the research, development, and conceptual design functions.
4. "Engineering Technology" is the profession in which knowledge of the applied mathematical and natural sciences gained by higher education, experience, and practice is devoted to application of engineering principles and the implementation of technological advances for the benefit of humanity. Engineering Technology education for the professional focuses primarily on analyzing, applying, implementing and improving existing technologies and is aimed at preparing graduates for the practice of engineering closest to the product improvement, manufacturing, and engineering operational functions.

AEROSPACE

Aerospace engineers design, analyze, model, simulate, and test aircraft, spacecraft, satellites, missiles, and rockets. Aerospace technology also extends to many other applications of objects moving within gases or liquids. Examples are golf balls, high-speed trains, hydrofoil ships, or tall buildings in the wind.

As an aerospace engineer, you might work on the Orion space mission, which plans on putting astronauts back on the moon by 2025. Or, you might be involved in developing a new generation of space telescopes, the source of some of our most significant cosmological discoveries. But outer space is just one of many realms to explore as an aerospace engineer. You might develop commercial airliners, military jets, or helicopters for our airways. And getting even more down-to-earth, you could design the latest ground and sea transportation, including high-speed trains, racing cars, or deep-sea vessels that explore life at the bottom of the ocean.

AGRICULTURAL AND BIOLOGICAL

Agricultural engineers apply knowledge of engineering technology and science to agriculture and the efficient use of biological resources. In addition to creating advances in farming and agriculture, agricultural engineers apply engineering design and analysis to protecting natural resources, develop power systems to support agriculture, and provide environmental controls.

AUDIO

Most people take the sounds we hear every day for granted. But it may surprise you to learn that the creation of audio is a unique endeavor that blends both art and science. Did you ever stop to think how they created the sounds in a video game, or in a movie, TV show or at a concert? There are literally thousands of different jobs available in this field that are as rewarding as they are challenging. There are many career choices in the field of Audio Engineering. Perhaps you are a musician, are interested in electronics and sound, or like the idea of working with people who produce and perform in the many fields of entertainment. You will find challenging and fulfilling work in audio engineering.

BIOENGINEERING AND BIOCHEMICAL

Bioengineers study living systems and apply that knowledge to solve various problems. They study the safety of food supplies, keep desirable organisms alive in fermentation processes, and design biologically based sensors. Bioengineering is widely used to destroy wastes and clean up contaminated soil and water. These engineers contribute greatly to human health and the environment.

BIOMEDICAL

Biomedical Engineers study biology and medicine to develop technologies related to health care. They develop medical diagnostic machines, medical instruments, artificial organs, joint replacement parts, and prosthetic devices. Rapid advances in these areas will probably continue throughout your lifetime.

CERAMIC AND MATERIALS

Ceramic and Materials Engineers solve problems by relying on their creative and technical skills - making useful products in many forms from common as well as exotic materials. Every day we use a multitude of these products. Each time we talk on the phone, use a computer, or heat food in a microwave oven, we are using products made possible by the inventions and designs of engineers working with ceramics and other materials.

CHEMICAL

Everything around us is made of chemicals. Chemical changes can be used to produce all kinds of useful products. Chemical Engineers discover and manufacture better plastics, paints, fuels, fibers, medicines, fertilizers, semiconductors, paper, and all other kinds of chemicals. Chemical Engineers also play an important role in protecting the environment, inventing cleaner technologies, calculating environmental impacts, and studying the fate of chemicals in the environment.

CIVIL

What would it feel like to have the expertise to build a school that could withstand an earthquake, a road system that puts an end to chronic traffic jams, or a sports stadium that offers everyone a great view? As a civil engineer, your job would be to oversee the construction of the buildings and infrastructure that make up our world: highways, skyscrapers, railways, bridges, and water reservoirs, as well as some of the most spectacular and high-profile of all engineering feats—think of the world’s tallest building, the towering Taipei 101 in Asia, or the Chunnel, the 31-mile-long tunnel beneath the English Channel. Civil engineers are fond of saying that it’s architects who put designs on paper, but engineers who actually get things built.

COMPUTER

Computer Engineering is the design, construction, implementation, and maintenance of computers and computer controlled equipment for the benefit of humankind. Most universities offer Computer Engineering as either a degree program of its own or as a sub-discipline of Electrical Engineering. With the widespread use and integration of computers into our everyday lives, it's hard to separate what an Electrical Engineer needs to know and what a Computer Engineer needs to know. Because of this, several universities offer a dual degree in both Electrical and Computer Engineering.

ELECTRICAL

As an electrical engineer, you could develop components for some of the most fun things in our lives (MP3 players, digital cameras, or roller coasters) as well as the most essential (medical tests or communications systems). This largest field of engineering encompasses the macro (huge power grids that light up cities, for example) as well as the micro (including a device smaller than a millimeter that tells a car’s airbags when to inflate). As an electrical engineer, you might work on robotics, computer networks, wireless communications, or medical imaging—areas that are at the very forefront of technological innovation.

ENVIRONMENTAL

Environmental Engineering is the study of ways to protect the environment. Most of us care deeply about stopping pollution and protecting our natural resources. Imagine yourself having more than just a passion for saving our environment, but also possessing the actual know-how to do something about these alarming problems! As an environmental engineer, you'll make a real difference in the survival of our planet by finding ways of cleaning up our oceans, rivers, and drinking water, developing air pollution equipment, designing more effective recycling systems, or discovering safe ways to dispose of toxic waste.

GEOLOGICAL AND GEOPHYSICAL

Geological and Geophysical Engineers draw on the science of geology to study the earth, using engineering principles to seek and develop deposits of natural resources and design foundations for large buildings, bridges, and other structures. Related engineering fields include Civil, Mineral, Mining, and Petroleum.

INDUSTRIAL

Industrial engineers determine the most effective ways to use people, machines, materials, information, and energy to make a product or to provide a service. Sometimes they are called "efficiency experts." Do you think of yourself as super organized? Do you think you're good at understanding the big picture and figuring out how things could work better? If so, you might make a great industrial engineer. Your job would involve organizing people, places, equipment, and information, ensuring that complex and large-scale systems operate safely and efficiently. For example, you might keep a hospital operating room running like clockwork. You might make sure an assembly line runs smoothly both for people and machines. Or you might be involved in adding a little extra fun and convenience to people's lives by figuring out ways of making amusement park lines shorter, or by seeing to it that a big clothing chain always has every size of jeans in stock. Although most industrial engineers work in manufacturing industries, they may also work in consulting services, healthcare, and communications.

MANUFACTURING

Manufacturing means making things. Manufacturing engineers direct and coordinate the processes for making things - from the beginning to the end. As businesses try to make products better and at less cost, it turns to manufacturing engineers to find out how. Manufacturing engineers work with all aspects of manufacturing from production control to materials handling to automation. The assembly line is the domain of the manufacturing engineer. Machine vision and robotics are some of the more advanced technologies in the manufacturing engineers toolkit. The beginning of the manufacturing process often involves creating prototypes or models of the desired object. In the past, these prototypes were created from wood or clay (kind of like sculpting). Today rapid prototyping is the state of the art. There are a number of types of rapid prototyping systems currently available, but one of the coolest is called stereolithography. A computer-controlled laser shoots through a pool of liquid plastic and forms a solid plastic part which is literally pulled out of the liquid. Manufacturing engineers use rapid prototyping to reduce time to market for something new as well as reducing production cost.

MARINE AND OCEAN

These engineering fields are closely related, and deal with the design of ocean vehicles, marine propulsion systems, and marine structures such as harbors, docks, and offshore drilling platforms. These engineers are exploring and developing the natural resources and transportation systems of the ocean. Two hundred miles off the coast of Washington state, a research ship hovers on the sea's surface, manipulated by navigational satellites hundreds of miles above. A thin cable of fiber-optic strands and electrical conductors connects the ship to a remotely-piloted robotic vehicle on the seafloor 7,000 feet below as it shoots live, high-definition video of volcanic smoker vents and strange life-forms. The video is linked, real time, to a communications satellite 22,500 miles above and, from there, into classrooms coast to coast.

MECHANICAL

As a mechanical engineer, you might develop a bike lock or an aircraft carrier, a child's toy or a hybrid car engine, a wheelchair or a sailboat—in other words, just about anything you can think of that involves a mechanical process, whether it's a cool, cutting-edge product or a life-saving medical device. Mechanical engineers are often referred to as the general practitioners of the engineering profession, since they work in nearly every area of technology, from aerospace and automotive to computers and biotechnology.

MINING

Mining engineers study all phases of extracting mineral deposits from the earth. They design mines and related equipment and supervise their construction and operation. They also work to minimize the environmental effects of mining. These engineers supply energy and rare materials

NUCLEAR

Nuclear engineers harness the power of the atom to benefit humankind. They search for efficient ways to capture and put to beneficial use those tiny natural bursts of energy resulting from sub-atomic particles that break apart molecules. As a nuclear engineer, you may be challenged by problems in consumer and industrial power, space exploration, water supply, food supply, environment and pollution, health, and transportation. Participation in these broad areas may carry you into many exciting and challenging careers. These may include interaction of radiation with matter, radiation measurements, radioisotope production and use, reactor engineering, and fusion reactors and materials.

PETROLEUM

Petroleum engineers study the earth to find oil and gas reservoirs. They design oil wells, storage tanks, and transportation systems. They supervise the construction and operation of oil and gas fields. Petroleum engineers are researching new technologies to allow more oil and gas to be extracted from each well. They help supply the world's need for energy and chemical raw materials.